



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/519,948

12/29/2004

Hidekazu Kimura

DP-941 US

5030

21254

7590

05/13/2009

MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC  
8321 OLD COURTHOUSE ROAD  
SUITE 200  
VIENNA, VA 22182-3817

EXAMINER

CHU, HELEN OK

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

05/13/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/519,948	<b>Applicant(s)</b> KIMURA ET AL.	
	<b>Examiner</b> Helen O. Chu	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5,9-16,20-22 and 29-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,9-16,20-22,29-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. The Applicants' Amendments have been received on February 2, 2009. Claims 1-5, 9-16, 20-22 have been amended. Claims 29-35 are new. Claims 6-8, 17-19, 23-28 have been cancelled.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 31 and 32 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation "center line roughness" is unclear to the Examiner. Specifically, it is unclear how one skilled in the art would determine where the "center line" of a surface is located. Appropriate corrections or further clarification is required.

### ***Claims Analysis***

4. The "center line roughness" will be interpreted as the average porosity since it was not defined in the recitation was not defined in the specification.

### ***Claim Rejections - 35 USC § 102***

5. The rejections under 35 U.S.C. 102, on claims 1-5, 12- 16, 20 and 21 are withdrawn because Applicants have amended the claims.

***Claim Rejections - 35 USC § 102/103***

6. The rejections under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103 (a) as obvious over Yi et al. (US Publication 2001/0004501 A1) as evidence by Yamamoto et al. on claims 9, 10, 20, 21 are withdrawn because the Applicants amended the claims.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-5, 12-16, 29, 30 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103 (a) as obvious over Yi et al. (US Publication 2001/0004501 A1).

Regarding claims 1, 12 and 29, 30 the Yi et al. reference discloses a fuel cell having a solid electrolyte sandwiched between a fuel electrode with fuel reactant gas entering and an oxygen electrode with oxidant entering (P3 and P4). The oxidant electrode comprises a base and a catalyst layer. The catalyst layer (74) is between the electrolyte (70) and the base. The base material of the oxidant electrode further includes a first layer with hydrophobic properties (106) closest to the catalyst layer and a second layer includes hydrophilic properties (Fig. 5, 102). The hydrophilic layer is said

Art Unit: 1795

to be porous (P66, Applicants roughen surface). The Yi et al. reference does not disclose how the hydrophilic layer is roughened, however, limitations of “roughened surface, said roughened surface comprising one of a sandblasted surface and an acid treated surface” are product-by-process claims. “Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Since fuel cell electrode is similar to that of the Applicant’s, Applicant’s process is not given patentable weight in this claim.

Regarding claims 2-5, and 13-16 the Yi et al. reference discloses that the first and second layers are made of porous carbon layers wherein the first layer is made of Toray carbon paper (67) and includes Teflon (Applicants fluoro-resin water repellent)

### ***Claim Rejections - 35 USC § 103***

9. The rejections under 35 U.S.C. 103(a) as being unpatentable by Yi et al. (US Publication 2001/0004501 A1) in view of Cipollini (US Patent 6,379,827 B1) in further view of Andelman (US Publication 2004/0012913) on claims 11 and 22 are maintained.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable by Yi et al. (US Publication 2001/0004501 A1).

The Yi et al. reference discloses the invention above and further incorporated herein. The Yi et al. reference does not disclose the second layer has a center line average roughness that is greater than a center line average roughness of a surface of the first layer however, the Yi et al. reference discloses that the hydrophilic layer must have a predetermined porosity. The prior art teaches that by controlling the number of pores within the hydrophilic substrate that contain water, the water will not flood the pores preventing any migration of reactant gases (P9) . Since the Yi et al. reference discloses that the porosity can be controlled, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed value through process optimization, since it has been held that the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable values involve only routine skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980).

12. Claims 9-11 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable by Yi et al. (US Publication 2001/0004501 A1) in view of Cipollini (US Patent 6,379,827 B1) in further view of Andelman (US Publication 2004/0012913).

The Yi et al. discloses the claimed invention above and further incorporated herein. The Yi et al. discloses the plate (86) to be made of porous graphite (current collectors), however, it is unknown how the porous graphite plate is fixed and assembled onto the other porous graphite plate (89) and the hydrophilic layer (102) to make an assembled fuel cell. The Cipollini reference discloses an identical invention as

Art Unit: 1795

disclosed by Yamamoto et al., the Cipollini reference further discloses the two conductive porous plates (inherently current collectors: Fig. 2) are bonded together (4:15-20) but does not disclose how the two plates are bonded. The Andelman reference discloses fuel cell electrodes (P2) are known in the art to be bonded by PTFE, the binder material can be formed by coating the current collector (10). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the binder of PTFE adhesion of current collectors to the fuel cell as disclosed by Andelman into the fuel cell electrode as taught by both Yamamoto et al. and Cipollini in order facilitate current flow and ensuring a tight and effective fuel cell. The substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

When a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result. **KSR v. Teleflex** Furthermore, PTFE is well known in the art to be hydrophobic as disclosed by the Yi et al. reference (P53)

13. Claims 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable by Yi et al. (US Publication 2001/0004501 A1) in view Appleby et al. (US Publication 2001/0026884 A1)

The Yi et al. reference discloses the claim discloses the claimed invention above and further incorporated herein. The Yi et al. reference discloses graphite current collector plates however, the Yi et al. reference does not disclose foam metal of nickel.

Art Unit: 1795

However, The Abbleby et al. reference discloses that porous metals are known to be an attractive alternative to heavy graphite plates. Some examples in clued foam metals made of porous nickel (P10). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to incorporate metal foams in lieu of graphite current collectors for weight management making portable electrochemical cells for portable applications.

### ***Response to Arguments***

14. Applicant's arguments filed 2/2/2009 have been fully considered but they are not persuasive.

Applicants' principal arguments are:

a) The Applicants argue, "*However, Applicant respectfully submits that the above 35 U.S.C. § 102(b) and the 35 U.S.C. § 103(a) rejections are clearly erroneous. Specifically, Yamamoto was published on December 12, 2002. The present invention has a priority date of July 3, 2002. Thus, Yamamoto is not a prior art reference of the present invention, and cannot be applied in a prior art rejection against the present invention. Therefore, since the 35 U.S.C. § 102 and 103 rejections are clearly invalid, Applicant respectfully requests the Examiner to withdraw the aforementioned rejection and issue a new Non-Final Office Action.*" However, the Applicants have mistaken the rejection. Please note that in citing Yamamoto reference as evidence of inherency, the discussion found in MPEP j2124, Exception to the Rule That the Critical Reference Date Must Precede the Filing Date applies. That is, in certain circumstances, references cited to show a universal fact need not be available as prior art before applicant's filing date.



Art Unit: 1795

In re Wilson, 31 F.2d 266, 135 USPQ 442 (CCPA 1962). Such facts include the characteristics and properties of a material or a scientific truism. Therefore, a new Non-Final Office Action is required.

b) Applicant argues, “Yi discloses a fuel cell power plant (Yi at Abstract). The Examiner alleges that Yi anticipates the claimed invention. However, Yi clearly fails to teach or suggest all features of the claimed invention. Specifically, Yi clearly fails to teach or suggest a fuel cell, “comprising... a second layer . . . comprising a roughened surface, said roughened surface comprising one of a sandblasted surface and an acid-treated surface”, as is recited, for example, in claim 1 (Application at page 11, paragraphs 2-4).

The Examiner fails to substantively consider this exemplary feature in the Office Action dated October 22, 2008. Regardless, neither Yi nor Yamamoto teaches this exemplary feature” Again, The hydrophilic layer is said to be porous (P66, Applicants roughen surface). The Yi et al. reference does not disclose how the hydrophilic layer is roughened, however, limitations of “roughened surface, said roughened surface comprising one of a sandblasted surface and an acid treated surface” are product-by-process claims. “Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Art Unit: 1795

Since fuel cell electrode is similar to that of the Applicant's, Applicant's process is not given patentable weight in this claim.

c) The Applicants argue, " In addition, the Examiner alleges that Yi "discloses a water transport plate (86) to be made of porous graphite." The Examiner alleges that this teaches the invention of claims 9, 10, 20, and 21. However, the third layer of claims 9, 10, 20, and 21 has hydrophobic properties. There is no teaching or suggestion by Yi of the water transport plate 86 having hydrophobic properties. In fact, Yi teaches that the water transport plate 86 has hydrophilic properties (Yi at paragraph [0057]). Further, Yi fails to teach that the water transport plate 86 is made of porous graphite as the Examiner alleges" However, please considered the rejection above under Item 12.

d) Arguments under Cipollini and Andelman reference have been considered, however, please consider above response to above arguments.

### ***Conclusion***

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

Art Unit: 1795

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/519,948

Page 11

Art Unit: 1795

HOC

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795